

REMARKS/ARGUMENTS

Favorable reconsideration of this application is requested in view of the above amendments and in light of the following remarks and discussion.

Claims 1-11 and 13-19 are pending. Claim 12 is canceled without prejudice or disclaimer. Claims 1, 6, 7, 13, 18, and 19 are amended. Support for the amendments to Claims 1, 6, 7, 13, 18, and 19 is self-evident. No new matter is added.

In the outstanding Office Action, the specification was objected to as including an Abstract exceeding 150 words in length and for other informalities. Claims 13-19 were rejected under 35 U.S.C. § 102(b) as anticipated by Van Autryve et al. (U.S. Patent No. 6,014,979, herein "Van Autryve"). Claims 1-4 were rejected under 35 U.S.C. § 102(b) as anticipated by Ma et al. (U.S. Patent Pub. 2002/0006674, herein "Ma"). Claims 1-5 were rejected under 35 U.S.C. § 103(a) as obvious over Van Autryve. Claims 5-12 were rejected under 35 U.S.C. § 103(a) as obvious over Ma. The Restriction Requirement dated December 4, 2006, was withdrawn.

Regarding the objection to the Abstract as exceeding 150 words, Applicants respectfully submit that the Abstract is currently fewer than 150 words in length. Accordingly, Applicants respectfully request that the objection to the Abstract be withdrawn.

Regarding the objection to the specification for informalities, the specification is amended to address the informalities and clarify the terminology set forth in the specification. Accordingly, Applicants respectfully submit that the objection to the specification is overcome.

Regarding the rejection of Claims 13-19 as anticipated by Van Autryve and the rejection of Claims 1-5 as obvious over Van Autryve, those rejections are respectfully traversed by the present response.

By way of review, the invention as recited in Claims 1 and 6 is directed to a plasma processing method. The claimed plasma processing method includes a first and a second plasma processing, which are performed sequentially, and a dry cleaning performed between the first and the second plasma processing. The first and second plasma processing and the dry cleaning are performed in a single chamber. The first plasma processing is a plasma etching during which deposits are produced and accumulated in the chamber. The deposits are removed by means of the dry cleaning which utilizes dummy substrates. The dry cleaning is performed by supplying into the chamber a deposit removing gas and a dummy substrate etching gas. After the dry cleaning is carried out, the second plasma processing is performed. **The second plasma processing is a plasma etching which produces substantially no deposits in the chamber (hereinafter, referred to as "depoless etching").**

One benefit of the processes recited in Claims 1 and 6 is the reduction of unwanted etching gas produced by deposits left by the first process. If the deposits accumulated during the first plasma processing remain in the chamber while the second plasma processing is performed, the deposits will be decomposed and emit an etching gas in the chamber during the second plasma processing, since the second plasma processing is a depoless etching. In such a situation, the substrate in the chamber would be overly etched due to the etching gas generated from the deposits. Therefore, the dry cleaning performed after the first plasma processing and prior to the second plasma processing is more than merely removing dusts or particles. It helps prevent the etching performance of the second plasma processing from being degraded or contaminated by an etching gas generated from the earlier deposits.

In contrast, Van Autryve fails to teach or suggest a second step performed after a dry cleaning step, wherein the second plasma processing step includes a plasma etching performed without producing deposits in the chamber.

Regarding this deficiency in Van Autryve, the outstanding Office Action states:

Van Autryve is silent about the second substrate processing step, wherein the deposits are not accumulated in the chamber, however, this step is seemed to be immaterial to the inside chamber cleaning process since no deposits are produced in this step and therefore the presence/absence of this step does not materially affects the inside chamber cleanness.<sup>1</sup>

However, Applicants respectfully note that the PTO must show that all of the limitations are taught or suggested MPEP § 2143.03 states:

**All Claim Limitations Must Be Taught or Suggested** To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Thus, for a *prima facie* case of obviousness, the all the claim limitations must be taught or suggested, which Van Autryve fails to do.

Additionally, as discussed in the claim summary above, **the second step produces an effect on the overall quality of the claimed process**, and the fact that it does not deposit material on the chamber walls is not pertinent to whether the second step should be given patentable weight.

Accordingly, as Van Autryve is silent with regard to the second step recited in independent Claim 1, Applicants respectfully submit that Claim 1 and the claims depending therefrom patentably distinguish over Van Autryve for at least the reasons discussed above.

Regarding the rejection of Claims 13-19 as anticipated by Van Autryve, Applicants respectfully submit that independent apparatus Claims 13 and 18 recite substantially similar features to those discussed above regarding method Claims 1 and 6, but in apparatus format. Applicants respectfully note that there is no requirement that the structure be defined by what

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<sup>1</sup> Outstanding Office Action, page 5.

it is instead of what it does, and the recitation of the function of the claimed apparatus should be given patentable weight. MPEP § 2173.01 states, “Applicant may use functional language, alternative expressions, negative limitations, or any style of expression or format of claim which makes clear the boundaries of the subject matter for which protection is sought.” As noted by the court in *In re Swinehart*, 439 F.2d 210, 160 USPQ 226 (CCPA 1971), “a claim may not be rejected solely because of the type of language used to define the subject matter for which patent protection is sought.” Accordingly, Applicants respectfully submit that amended independent Claims 13 and 18 and Claims 14-17 and 19 depending therefrom patentably distinguish over Van Autryve for at least the same reasons as amended independent Claim 1 does.

Regarding the rejection of Claims 1-4 as anticipated by Ma, that rejection is respectfully traversed by the present response.

Amended independent Claim 1 recites, in part:

wherein the second plasma processing step includes a plasma etching performed without producing deposits in the chamber.

With respect to the above-noted feature recited in Claim 1, the outstanding Office Action states:

Ma teaches a plasma processing method wherein the substrate is etched in the plasma processing step, which creates particle build up on the chamber walls, followed by chamber clean process and subsequent plasma processing steps(s), **wherein the particle build up on the chamber walls is/are not reported...** Therefore, all the processing steps as claimed are met by Ma.<sup>2</sup>

Accordingly, it appears that, for the second plasma processing step, the outstanding Office Action relies on processes subsequent to the cleaning in Ma in which a build up of deposits on the chamber walls is not discussed.

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<sup>2</sup> Outstanding Office Action, pages 3-4.

Applicants respectfully submit that Ma is silent with regard to whether deposits are formed during the processes performed subsequently to the cleaning, and **more than silence in this regard is required to establish that such deposits are not formed.** See *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) ('[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obvious-ness')."

Ma fails to teach or suggest a second plasma processing step that includes a plasma etching performed without producing deposits in the chamber. Accordingly, Applicants respectfully submit that amended independent Claim 1 and Claims 2-4 depending therefrom patentably distinguish over Ma for at least the reasons discussed above.

Regarding the rejection of Claims 5-12 as obvious over Ma, that rejection is respectfully traversed by the present response. As Claim 12 is canceled without prejudice or disclaimer, any rejection of Claim 12 is negated.

Claim 5 depends from amended independent Claim 1 and patentably distinguishes over Ma for at least the same reasons as Claim 1. Amended independent Claim 6 recites substantially similar features to amended independent Claim 1, and therefore, Claim 6 and Claims 7-11 depending therefrom patentably distinguish over Ma for at least the same reasons as amended independent Claim 1 does.

Neither Ma nor Van Autryve teaches or suggests that a depoless etching is performed after the dry cleaning of the chamber. Moreover, the cited references fail to disclose the above-mentioned technical effects achieved by removing the deposits prior to the depoless etching. It is asserted in the outstanding Office Action that the second plasma processing is immaterial to the inside chamber cleaning process. However, the dry cleaning is incorporated to the claimed plasma processing method to prevent from the generation of an etching gas in the following depoless etching. The claimed invention stems from the feature

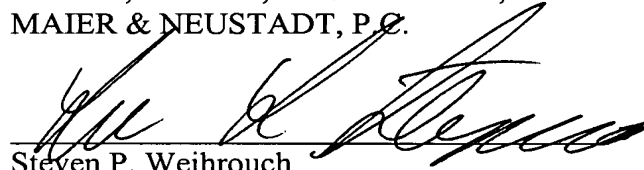
or condition that the second plasma processing is a depoless etching, and this is an important feature which differentiates the claimed invention from the disclosure of the cited references.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance for Claims 1-11 and 13-19 is earnestly solicited.

Should Examiner Kornakov deem that any further action is necessary to place this application in even better form for allowance, he is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

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